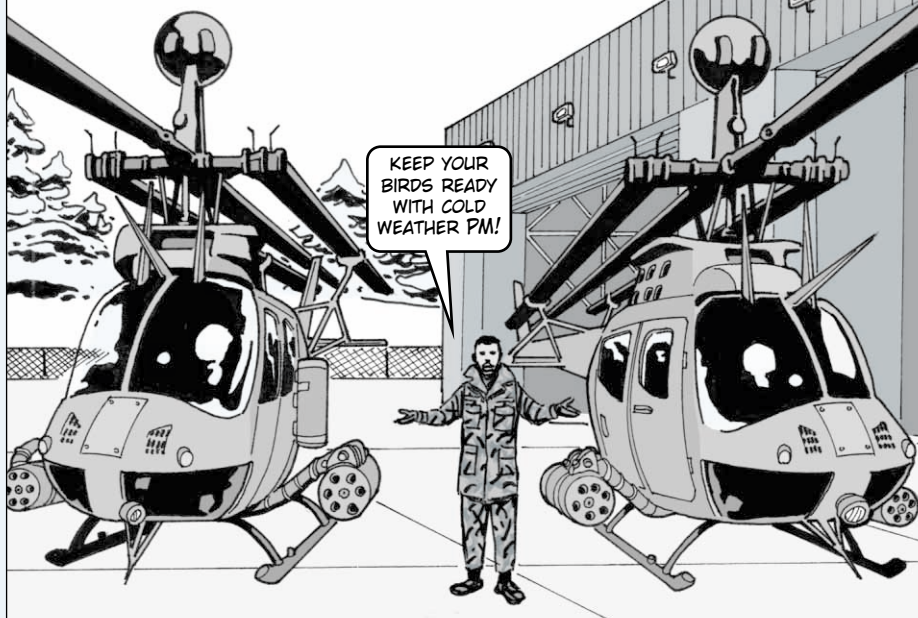


## KEEP BIRDS FLYING IN BONE-CHILLING COLD



An aircraft needs attention when the temperature takes a dive and Old Man Winter hurls snow, wind and ice at you. But top-notch aircraft mechanics know that preventative maintenance is hard during knee-knocking cold weather.

When winter starts putting its grip on you, move your aircraft inside to perform maintenance. If you can't move inside and you're faced with some extended time outside, use a maintenance shelter or rig a temporary shelter out of canvas or a salvaged cargo parachute canopy. Warm your shelter with a ground heater.

A warm and ventilated work area will let you get the PM done without the nuisance of bulky clothing and heavy gloves.

If you can't rig a shelter, dress for the cold. Work in short bursts and take breaks to warm up.

HERE ARE  
OTHER  
POINTERS TO  
CONCENTRATE  
ON DURING  
COLD  
WEATHER.

## Cold Fuel

Water in fuel can form ice that blocks fuel lines. So keep fuel tanks topped off. The gap between the top of the tank and the fuel is full of cold moist air. When that moisture condenses, water drips into your fuel.



When you refuel a bird outside in sub-zero temperatures, always check the fuel level before moving it inside. When an aircraft with a full fuel tank is moved into the hangar, the fuel level will rise as the fuel warms and expands. Opening the filler cap could give you a fuel spill to clean up.

Static electricity can ruin a cold day too, so be extremely cautious during refueling. The lower the temperature, the drier the air, the more static electricity becomes a fire hazard.

Static can result from aircraft moving through the air or by the movement of frost or snow across the aircraft surface. Fuel flowing through the filler neck can also generate a spark that could ignite the fuel.

So make sure you find a good place to ground the aircraft. Also make sure the aircraft and tanker are electrically bonded together, and the nozzle is electrically bonded to the bird before you remove the cap. When you're freezing while refueling, you might be tempted to neglect a ground or bond. **Don't!** You must follow grounding procedures without shortcuts.



If you're not using a closed circuit fueling nozzle, put the regular nozzle in all the way. That keeps the danger of static down and reduces the chance for a spill.

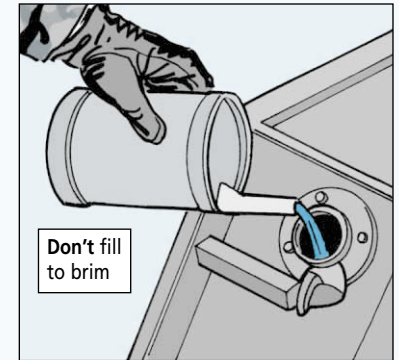


## Cold Oil and Grease

Fuel is affected by cold weather but so is oil and grease. As the mercury plummets, fuel is harder to ignite, oil thickens, and grease gels. So you must use the right fuel and lube for cold conditions. Follow your TMs' recommendations for the right fuel, oil, and grease to use in winter.

When you service oil systems on a stone-cold aircraft, never fill oil reservoirs to the brim. Otherwise, when the oil heats up, you can count on cleaning up oil overflows.

Oil leaks are a chronic problem in winter weather. So check connections, joints, gaskets and seals regularly, especially during pre-flight inspections.



## Cold Seals

Old Man Winter is unrelenting and seals and gaskets get the brunt of his blast.

When they contract due to cold, they open the door for leaks. Moisture can seep in around seals and freeze. The ice formed will cut seals. Get familiar with your bird's vulnerable seal and gasket trouble spots. Clean all exposed pistons of servos daily to prevent ice and dirt build-up. That will reduce the wear and tear on seals and gaskets. Make sure all leaks are taken care of.

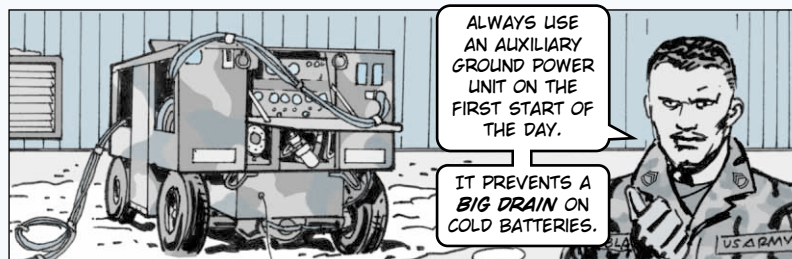
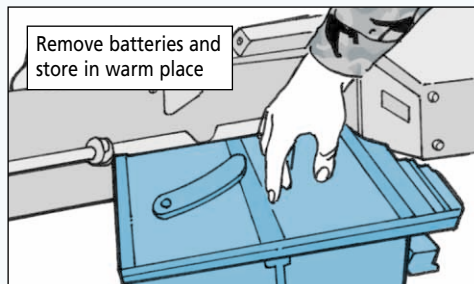




## Cold Batteries

Your nickel-cadmium batteries will do their job without much extra effort on your part. But if your bird sits in a deepfreeze for days on end, cold starts will shorten battery life.

When possible, bring your batteries in from the cold if the forecaster predicts several days of subfreezing temperatures. If it's not possible, turn on the landing gear lights, searchlight or cabin lights, for 30 seconds before an engine start. That "load" will warm up the battery a bit.



Lead-acid batteries should also be kept warm. Cold lead-acid batteries lose their charge much faster than nickel-cadmiums. If you bring your batteries inside, never store nickel-cadmium and lead-acid in the same area. Fumes from the lead-acid battery can cause the nickel-cadmium to discharge.



## Cold Tires

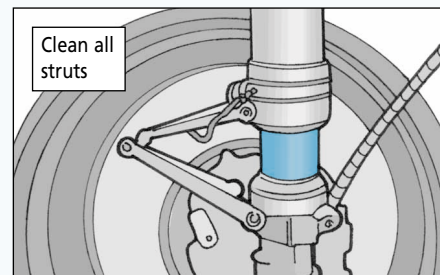
Cold reduces tire air pressure, so check your helicopter's tire pressure often.

Tires frozen to the ground can be freed with liquid deicer. Move the aircraft immediately because deicer will form slush and re-freeze.

Check your landing gear often. Use a clean rag dampened with hydraulic fluid to remove ice, dirt and grit from the struts and pistons.

Service pressurized systems according to the instructions in each aircraft maintenance manual. Remember that any moisture will freeze into ice crystals and damage seals.

Do not bend rubber hoses or rubber-covered wires while they're cold soaked. Rubber gets brittle and stiff and could crack.



## Cold Weather Guides

For more information on winter maintenance operations, check out FM 31-70, *Basic Cold Weather Manual* (Apr 68) and FM 31-71, *Northern Operations* (Jun 71).

When the cold hits, make sure you hit your -23 maintenance manuals and chapter 10 of your general aircraft TM 1-1500-204-23-1 for good cold weather PM to protect your birds, so you can fly high.

If your bird has specific covers for the rotor head and engine plugs, use them. If covers are unavailable in heavy snow, remove the snow accumulation periodically during snowfall.

Extreme caution should be exercised around cold metal. Working on small parts often requires removing your gloves. Stop work frequently to put your gloves back on to warm up your hands. Use the buddy system to keep frostbite in check.